TRANSLATION
OF
DE 37008861 A1

FROM GERMAN TO ENGLISH

(12 PAGES INCLUDING THIS COVER PAGE)

0409BBL

115582-014 (DE 3700861A1)

Translated by Bryan Saliamonas

August 18, 2004

3,426 words

Notes to Translation:

1) Claim 4, etc. – the German text appears to inadequately describe how the machine works.

Where the author repeatedly writes the German equivalent of

the rotation of the arrow (19) is simulated by the extinguishing of successive arrow fields (18) starting with a field (18) that forms a start field (20).

what is probably meant is

the rotation of the arrow (19) is simulated by the illuminating and extinguishing of successive arrow fields (18) starting with a field (18) that forms a start field (20).

2) The term *Gewinnfeld* has been translated as *winnings field* but may also be translated as *prize field* or *reward field.*

COIN-OPERATED GAMING MACHINE

Abstract

The invention relates to a coin-operated gaming machine that offers the prospect of winning, containing several rotary elements that are provided with symbols that determine a win or a loss and that are associated with display windows, and containing a microcomputer that is equipped with a random number generator and that serves for controlling the overall game sequence. The invention is characterized in that a rotary disk (15) that is marked with various winnings fields (16) is provided with an arrow (19) that rotates around it in the opposite direction, whereby the disk (15) and the arrow (19) comprise the same number of positions, and that, given the appearance of a particular combination of symbols in the display windows (5), the disk (15) and the arrow (19) rotate, these being stoppable virtually simultaneously by the actuating of a stop button (24), whereupon the winnings indicated on the disk (15) where the arrow (19) points are awarded.

Patent Claims

1. Coin-operated gaming machine that offers the prospect of winning, containing a plurality of rotary elements that are provided with symbols that determine a win or a loss, which symbols are associated with display windows, and containing a microcomputer that is equipped with a random number generator, said computer serving to control the overall game sequence, characterized in that a rotary disk (15) that is marked with different winnings fields (16) is provided with an arrow (19) that rotates around the disk in the opposite direction, said disk (15) and said arrow (19) comprising the same number of positions, and that, whenever a specified symbol combination appears in the display windows (5), the disk (15) and the arrow (19) rotate and are stoppable virtually at the same time by activation of a stop button (24), whereupon the winnings designated on the disk (15) where the arrow (19) points are awarded.

2. Gaming machine according to claim 1, characterized in that the rate of rotation of the circular disk (15) is greater than the rate of rotation of the arrow (19) that points to the disk (15).

3. Gaming machine according to claims 1 and 2, characterized in that the adjacent sector-shaped winnings fields (16) of the disk (15) are alternately marked with extra games or money winnings.

4. Gaming machine according to claims 1 to 3, characterized in that the disk (15) is surrounded by illuminatable arrow fields (18) that are associated with the individual winnings fields (16) of the disk (15), and that the rotation of the arrow (19) is simulated by the extinguishing of successive arrow fields (18) starting with a field (18) that forms a start field (20).

5. Gaming machine according to the claims 1 to 4, characterized in that the start field (20) of the rotation of the arrow (29) is freely selectable from the arrow fields (18) by means of a button (23).

6. Gaming machine according to the claims 1 to 5, characterized in that, depending on the appearance of different symbol combinations in the display windows (5), a different number of arrows (19) is illuminated in the arrow fields (18), which rotate simultaneously in the direction opposite the rotary disk (15) through an incremental succession of extinguishments of subsequent arrow fields (18) and which, after they and the disk (15) have stopped, mark a corresponding number of winnings fields (16) of the disk (15) whose indicated winnings are awarded as total winnings.

7. Gaming machine according to claim 6, characterized in that two opposing arrows (19) are set in the arrow fields (18) given a specified symbol combination.

8. Gaming machine according to claim 6, characterized in that four arrows (19) are set in the arrow fields (18) in a cross configuration given a specified symbol combination.

Description

The invention relates to a coin-operated gaming machine that offers the prospect of winning, containing a plurality of rotary elements that are provided with symbols that determine a win or loss, which symbols are associated with display windows, and containing a microcomputer, which is equipped with a random number generator, for controlling the overall game sequence.

Coin-operated gaming devices of this type are known in a wide variety of embodiments. They have at most three rotary elements, which can be in the form of cylinders or disks. On the surface of the rotary elements that is visible from the outside through the display windows, the rotary elements bear winnings symbols. The revolving elements are usually stopped in succession, and after all revolving elements have been stopped, the symbol combination appearing in the display windows determines a win or a loss. This is apparent from a winnings diagram on the front panel of the gaming machine. Particular symbol combinations lead to a plurality of what are known as extra games. In order to increase the chances of winning, these are games with a higher expected payout in the event of a win.

Various measures have been taken to prompt a player to use such machines, to entertain him during the game, and to provide him with further inducements to play. Control elements for the player such as keys, levers, and buttons are attached to many of these gaming machines. These control elements usually influence the movement of the individual rotary elements. For instance, the player can be given the capability to start one or more of the rotary elements by activating a control element such as a start key, whereby he is given real influence over the events of the game. Stop keys are also provided in order to give the player the ability to arrest a rotary element as it

rotates, which gives him the impression of being able to influence the events of the game and the resulting symbol combination.

Additional inducements to play are provided by fields with winnings display elements that are illuminated whenever specified winnings are achieved. Many games must be played in order to achieve higher winnings, particularly in the case of extra games. In order to make the game more varied, risk functions have been developed which give the player the option to increase the winnings he has already achieved at the risk of losing. There are also known machines that allow the player to increase the achievable winnings without suffering a loss.

In the modern gaming machines on the market today, the overall course of the game including win determination and payout is controlled electronically by a microcomputer containing a program corresponding to the respective game sequence. What is known as a random number generator is allocated to the microcomputer in order to exclude any regularity or mathematical logic in the determination of a win or loss in consecutive games, so that the result of each game depends on chance. At the very outset of the rotation of the individual rotary element, the random number generator determines the symbol constituting a portion of the final symbol combination that is to appear and arrests the rotary element when this randomly determined symbol is located in the result position. The control buttons by means of whose activation the player intends to influence the game are also connected to the microcomputer, so that a potential restart or a premature stopping of the rotary elements can be performed in order to offer the player the customary entertainment.

The object of the invention is to design the game sequence and the possibilities of winning in a gaming machine of the kind described above so as to provide greater variety and a greater inducement to play, thereby increasing the entertainment value to the player.

This object is inventively achieved in that a rotary disk that is marked with different winnings fields is provided with an arrow that rotates around it

in the opposite direction, whereby the disk and the arrow have the same number of positions, and that, whenever a particular symbol combination appears in the display windows, the disk and arrow rotate such that they are stoppable virtually simultaneously by actuation of a stop button, whereupon the winnings designated on the disk where the arrow points are awarded.

In a gaming machine so configured, when the disk is at rest (i.e. the vast majority of the time) the player can clearly see the extra winnings he can receive at the appearance of a particular symbol combination. If this symbol combination then appears, the disk starts to rotate while the arrow starts to rotate in the opposite direction. The player no longer sees which winnings are located in which position. The arrow can then be purposely stopped in a position selected by the player by means of the stop button. The disk also stops with the stopping of the arrow. The arrow then points to the resulting winnings field of the disk, and the winnings designated in this winnings field are awarded. The player's excitement is constantly increased by the possible bonus events that may occur within a game in the interplay between the disk and the arrow, which also increases the inducement to play.

In a development of the invention, the rate of rotation of the circular disk is higher than the rate of rotation of the arrow that points to the disk. The relatively slow movement of the arrow permits the stopping of the arrow on the desired arrow field by means of skill, whereas the relatively fast movement of the disk permits stopping virtually simultaneously with the disk.

According to another development of the inventive gaming machine, beyond the legal maximum of money winnings, the player can achieve extra games with higher chances of winning compared to a normal game, whereby the sector-shaped adjoining winnings fields of the disk are alternately marked with extra games or money winnings, giving the player the chance to win extra games or money by stopping the rotating arrow accordingly.

According to an advantageous development of the invention, in order to achieve a simple and smooth rotation of the arrow from the standpoint of construction, the disk is surrounded by illuminatable arrow fields that are

associated with the individual winnings fields of the disk, it being possible to simulate the rotation of the arrow starting at an arrow field representing a start field by the extinguishing of the subsequent arrow fields in succession. In order to increase the entertainment value, the start field of the rotation of the arrow is freely selectable from the arrow fields by means of a button.

According to another embodiment of the inventive gaming machine, depending on the appearance of various symbol combinations in the display windows, a different number of arrows are illuminated in the arrow fields, which rotate simultaneously in the direction opposite the rotary disk through the incremental extinguishing of subsequent arrow fields in succession, and which, after they and the disk are stopped, mark a corresponding number of winnings fields of the disk whose designated winnings are awarded as total winnings.

The more arrows the player gets, the higher his chances of achieving the maximum winnings. The variable appearance of arrows in different numbers motivates the player to follow the progress of the game with interest, which provides substantial entertainment to the player. Given one specified symbol combination, two opposing arrows are preferably set in the arrow fields, and given another specified symbol combination, four arrows in the shape of a cross are set in the arrow fields.

The idea on which the invention is based is further explained below in connection with an exemplifying embodiment which is represented in the drawing. Shown are:

Fig. 1: a perspective front view of an inventive gaming machine;

Fig. 2: an enlarged detailed view of the disk with the appertaining circle of arrows according to Fig. 1, but with two arrows set;

Fig. 3: an enlarged detailed view of the disk with the appertaining circle of arrows according to Fig. 1, but with four arrows set;

Fig. 4: a basic block diagram of the wiring of the gaming machine according to Fig. 1.

The gaming machine 1 has three cylindrical rotary elements 2, 3, 4, each bearing a series of win and loss symbols. Only the respective portion of the elements 2, 3, 4 that is located inside the display window 5 in the front panel 5 of the housing 7 is visible. The two peripheral rotary elements 2 and 4 are each associated with two display windows 5 on top of one another, whereas the middle rotary element 3 is provided with only one display window 5. The symbol combination determining a loss or win appears in the display windows 5 after the rotary elements 2, 3, 4 have stopped. Arranged below the three rotary elements 2, 3, 4 are a coin indicator 8 and an extra game indicator 9 in the form of electronic displays, which indicate the amount of money in credit and the current number of extra games in credit. Arranged above the rotary elements 2, 3, 4 are a coin slot 10 and a coin return button 11. Provided in the lower region of the gaming machine 1 are a pay-out tray 12 and a control button 13 for influencing, i.e. restarting and stopping, the individual rotary elements 2, 3, 4.

Also arranged in the front panel 6 between the rotary elements 2, 3, 4 and the payout tray 12 is a circular disk 15 that rotates about an axis 14. The visible front surface of the disk 15 is partitioned into directly adjoining sector-shaped winnings fields 16. The individual winnings fields 16 are respectively marked with four, ten, twenty, or twenty-five extra games. Of course, the winnings fields 16 can also be marked with money winnings up to the legal maximum. A circle of arrows 17 formed by illuminatable arrow fields 18 surrounds the disk 15. Each arrow field 18 that points to the disk 15 is centrally allocated to a particular winnings field 16; i.e., the number of arrow fields 18 corresponds to the number of winnings fields 16. In order to simulate an arrow 19 rotating about the disk 15, an arrow field 18 serving as start field 20 is extinguished, and the subsequent arrow fields 18 are then extinguished in succession in the direction of the arrow 21, while the disk 15 rotates in the direction of arrow 22. The start field 20 of the arrow 19 can be freely selected by means of the button 23 next to the payout tray 12. By means of a stop button 24 that is located next to the button 23, the arrow 19

that is rotating in the circle of arrows 17 can be stopped in a desired arrow field 18, whereby the rotation of the disk 15 simultaneously ends.

If three identical DM [German marks] symbols appear in succession in the display windows 5, one of which can be seen in the upper display window 5 of the left-hand rotary element 4 in Fig. 1, then the amount of money designated by these symbols is awarded and displayed in the credit display 8. On the other hand, if a combination of three identical special symbols of a first type appears in windows 5, then in addition to money, extra games are awarded, which are displayed in the extra game display 9. Extra games offer the player a higher expectation of winning, because specified symbols on the middle rotary element alone give rise to a win of 3 DM. If a specified special symbol combination of a second type, for instance three successive numeral 7's, appear on the rotary elements 2, 3, 4, the arrow 19 is set in the circle of arrows 17 in start field 20. The player can then move the start field 20 of the arrow 19 within the circle of arrows 18 for a definite period of time. Next, the disk 15 is set in rotation in the direction of the arrow 22, and the arrow 19 is set in rotation in the direction of the arrow 21, whereby the rate of rotation of the disk 15 is greater than that of the arrow 19. With the aid of the stop button 24, the player can stop the arrow 19, which rotates from arrow field to arrow field by being extinguished, on a desired arrow field 18, whereby the disk 15 is simultaneously arrested. The arrow 19 now points to a specified winnings field 16 of the disk 15, whose designated extra games are now awarded.

If four special symbols of the second kind appear in the display windows 5, i.e. four numeral 7's appear in the display windows 5, then two opposing arrows 19 are set in the circle of arrows 17 as represented in Fig. 2. The two arrows 19 simultaneously run in the direction opposite the rotary disk within the circle of arrows 17. After the arrow 19 and disk 15 are stopped, the arrow 19 points to two winnings fields 16 of the disk 15, whose respectively designated extra games are added together and awarded as total winnings.

In the view of the disk 15 and appertaining circle of arrows 17 represented in Fig. 3, an arrow mask formed by four arrows 19 in the shape of

a cross is set in the circle of arrows 17. The four arrows 19 are displayed whenever five special symbols of the second type appear in the display windows 5 when the rotary elements 2, 3, 4 are stopped; i.e., in the present example the numeral 7 can be seen five times in the display windows 5. When the four arrows 18 have finished rotating in the circle of arrows 17, and the disk 15 has stopped, the four arrows 19 point to four associated winnings fields 16 of the disk 15. The number of extra games designated on these four winnings fields 18 is added up and awarded to the player as total winnings. With four arrows 19 set, the player can achieve the maximum number of extra games available on the disk 15.

The gaming machine 1 is controlled entirely by a microcomputer 25. In order to minimize the number of signal lines, all inputs and outputs, such as impulses relating to coins, rotary element scanning, disk scanning, or buttons, and information relating to rotary element motors, the disk motor, lamps, displays, and payout motors, are transmitted serially. All lamps are controlled based on a multiplexed lamp matrix; likewise the displays are multiplexed. In particular, the microcomputer 15 is responsible for randomly determining the stopping of the rotary elements 2, 3, 4 and the result of the bonus play (15, 19), and it displays to the player how his game is supposedly progressing using light and sound effects, as the case may be.

The power unit 26 is responsible for supplying the overall gaming machine 1 with power. The required voltages are derived from a mains transformer, rectified, and supplied to the various assemblies. The microcomputer 25 contains a write/read memory (RAM) as working memory, a read only memory (ROM) as program memory with an integrated random number generator, and other necessary assemblies such as buffers, clock generators, shift registers, and suchlike. The microcomputer 22 further contains a sound generator and appertaining AF amplifier. The motor control 27, operating under control of the microcomputer 25, sends the required signals for the stepping motors of the rotary elements 2, 3, 4 and communicates the synchronization signals received via a unit 18 for signal

detection and amplification from the rotary elements 2, 3, 4 to the microcomputer 15. Furthermore, the motor control 27 is actively connected to the stepping motor of the disk 15. An input/output unit 28 forms the interface for a multiplexed lamp matrix 29 that drives all lamps of the gaming machine 1 including those of the arrow fields 18 of the circle of arrows 17. The control buttons 30 and all displays 31 are driven by the microcomputer 25; i.e., their signals are fed to the microcomputer 25. Also connected to the microcomputer 25 is an assembly 32 representing the complete coin system of the gaming machine 1. The assembly 32 serves for adapting the coin impulses to the reprocessing electronics for detecting the coins that have been deposited and are still present in the coin memory as well as emitting the control impulses for the money payout motors.

The features of the invention disclosed above in connection with the description, drawings, and claims, either individually or in any combination, may be essential for realizing the invention in its various embodiments.